

Listing of Claims:

1. (Previously Presented) A switching control method for controlling traffic flow of an Ethernet frame comprising the steps of:

receiving an Ethernet frame containing predetermined priority information based on a type of traffic as a class of service (CoS) from a source node;

buffering the received Ethernet frame in a data buffer classified by the CoS;

comparing a size of data currently buffered in the data buffer with a predetermined threshold value;

when the size of data currently buffered in the data buffer is equal to or larger than the threshold value, generating a PAUSE frame containing a value of the CoS; and

transmitting the PAUSE frame to the source node.

2. (Original) The switching control method as set forth in claim 1, wherein the predetermined threshold value is necessary for determining a traffic congestion state.

3. (Original) The switching control method as set forth in claim 1, further comprising the steps of:

when a state of the data buffer is the traffic congestion state as a result of the comparison using the threshold value, determining whether or not a spare space remains in the data buffer; and

if a spare space remains in the data buffer as a result of the determination, storing the received Ethernet frame in the data buffer according to the priority information.

4. (Original) The switching control method as set forth in claim 3, further comprising the step of:

if a spare space does not remain in the data buffer as a result of the determination, discarding the received Ethernet frame.

5. (Original) The switching control method as set forth in claim 1, further comprising the step of:

when the size of data currently buffered in the data buffer is equal to or larger than the threshold value, setting a predetermined state flag indicative of a traffic congestion state.

6. (Original) The switching control method as set forth in claim 1, wherein the PAUSE frame further includes information of a predetermined pause time for which traffic transmission of a corresponding CoS is stopped.

7. (Original) The switching control method as set forth in claim 1, wherein the source node receiving the PAUSE frame stops transmission of an Ethernet frame having a priority of a corresponding CoS for a predetermined time.

8. (Original) The switching control method as set forth in claim 1, wherein information of the CoS is included in the PAUSE frame and header information of the Ethernet frame.

9. (Original) The switching control method as set forth in claim 1, wherein a priority of the CoS associated with voice traffic is higher than that associated with data traffic.

10. (Previously Presented) A switching control method for controlling traffic flow of an Ethernet frame which is received from at least one source node and is transmitted to at least one destination node, the method comprising the steps of:

extracting a payload of the Ethernet frame to be transmitted to the destination node from a data buffer according to a type of traffic as a class of service (CoS), the data buffer buffering the payload of the Ethernet frame based on the CoS;

comparing a size of data currently buffered in the data buffer with a predetermined threshold value;

when the size of data currently buffered in the data buffer is smaller than the threshold value, generating an UNPAUSE frame having a value of the CoS and information indicating termination of a PAUSE state; and
transmitting the UNPAUSE frame to the source node.

11. (Original) The switching control method as set forth in claim 10, wherein the predetermined threshold value is necessary for determining a traffic congestion state.

12. (Previously Presented) The switching control method as set forth in claim 10, further comprising the step of:

allowing the source node receiving the UNPAUSE frame to terminate the PAUSE state of traffic belonging to the CoS.

13. (Original) The switching control method as set forth in claim 10, further comprising the step of:

when the UNPAUSE frame is transmitted, setting predetermined flag information indicative of a traffic congestion state as a value of a traffic normal state.

14. (Original) The switching control method as set forth in claim 10, wherein the information indicative of the termination of the PAUSE state is time information set as a zero pause time.

15. (Previously Presented) A switching control method for controlling traffic flow of an Ethernet frame which is received from at least one source node and is transmitted to at least one destination node, wherein a PAUSE frame had been transmitted to the at least one source node, the PAUSE frame containing a value of a class of service (CoS) and information of a pause time for which traffic transmission of a corresponding CoS is stopped, the method comprising the steps of:

allowing a predetermined network unit controlling the traffic flow to start an internal timer and to determine whether the pause time has expired;

if the pause time has expired, comparing a size of data currently buffered in a data buffer based on a type of traffic as the CoS with a predetermined threshold value; when the size of data currently buffered in the data buffer is equal to or larger than the threshold value, re-generating a PAUSE frame containing a value of the CoS and information of the pause time; and transmitting the regenerated PAUSE frame to the source node.

16. (Original) The switching control method as set forth in claim 15, wherein the predetermined threshold value is necessary for determining a traffic congestion state.

17. (Original) The switching control method as set forth in claim 15, wherein the source node re-stops transmission of the Ethernet frame for a time included in the pause time information.

18. (Previously Presented) The switching control method as set forth in claim 15, further comprising the step of:

when the size of data currently buffered in the data buffer is smaller than the threshold value, generating an UNPAUSE frame in which the pause time for the CoS is set as “0” and transmitting the UNPAUSE frame to the input port coupled to the source node.

19. (Original) The switching control method as set forth in claim 18, wherein the UNPAUSE frame is generated in the same data format as a data format of the PAUSE frame.

20. (Previously Presented) A switching apparatus for controlling traffic flow of an Ethernet frame comprising:

at least one input port for receiving the Ethernet frame from a source node; at least one output port for transmitting the Ethernet frame to a destination node;

a shared memory shared between the input and output ports, the shared memory comprising:

a plurality of data buffers, each data buffer being classified based on a type of traffic as a class of service (CoS) for classifying and storing Ethernet frames received through the at least one input port; and

a plurality of sets of registers, each set of registers corresponding to one of the plurality of data buffers for registering reference information to be used based on the CoS corresponding to the one of plurality of data buffers; and

a switching main module for determining a traffic congestion state on the basis of the reference information, generating a PAUSE frame to stop traffic flow of a CoS corresponding to one data buffer of the plurality of data buffers when the one data buffer is in the traffic congestion state, and transmitting the PAUSE frame to the source node, wherein the PAUSE frame contains a value of the CoS.

21. (Original) The switching apparatus as set forth in claim 20, wherein the switching main module comprises:

a switching logic for switching a transmission path of the Ethernet frame between the source node and the destination node; and

a memory manager for classifying and storing the Ethernet frame received through the input port, generating the PAUSE frame, and transmitting the generated PAUSE frame to the source node.

22. (Previously Presented) The switching apparatus as set forth in claim 20, wherein the PAUSE frame contains information of a predetermined pause time for which traffic transmission of the CoS is stopped.

23. (Previously Presented) The switching apparatus as set forth in claim 20, wherein the switching main module further generates a UNPAUSE frame to resume traffic flow of the CoS when it is determined that the traffic congestion state in the one data buffer is switched to a normal state on the basis of the reference information,

and transmits the generated UNPAUSE frame to the input port coupled to the source node.

24. (Previously Presented) The switching apparatus as set forth in claim 20, wherein the switching main module further generates a UNPAUSE frame corresponding to the CoS when a pause time has expired and the size of data currently buffered in the one data buffer is smaller than a threshold value.

25. (Previously Presented) The switching apparatus as set forth in claim 20, wherein the switching main module further re-generates a PAUSE frame corresponding to the CoS when a pause time has expired and the size of data currently buffered in the one data buffer is equal or larger than a threshold value.

26. (Previously Presented) The switching apparatus as set forth in claim 20, wherein each set of the registers comprises:

first register for registering physical size information of the one of the plurality of data buffers;

second register for registering predetermined threshold values necessary for determining the traffic congestion state of the one of the plurality of data buffers;

third register for registering size information of data currently buffered in the one of the plurality of data buffers; and

fourth register for registering predetermined state flags indicative of the traffic congestion state of the one of the plurality of data buffers,

wherein the information registered in the first to fourth registers is used as the reference information.

27. (Previously Presented) The switching apparatus as set forth in claim 20, wherein the reference information comprises:

buffer size information indicative of maximum physical storage capacity of the one of the plurality of data buffers;

predetermined threshold information indicative of threshold storage capacity of the one of the plurality of data buffers necessary for determining the traffic congestion states based on the CoS;

current data amount information indicative of amount of data currently buffered in the one of the plurality of data buffers based on the CoS; and

state flag for setting the traffic congestion state based on the CoS.

28. (Previously Presented) The switching apparatus as set forth in claim 27, wherein the switching main module determines that the one data buffer is in the traffic congestion state when an amount of data currently buffered in the one data buffer based on the CoS is equal to or more than a threshold value.